Simultaneous discovery of bifrontal meningiomas and a glioblastoma multiforme

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DESCRIPTION

A 63-year-old woman presented to her general practitioner with progressive cognitive impairment and chronic headache. MRI of her brain demonstrated bilateral extra-axial enhancing frontal lobe masses of similar morphology and enhancement pattern (*white arrows*, [figure 1](#)) causing midline shift to the left and hydrocephalus. There was mild transependymal flow of cerebrospinal fluid from the atrium of the right lateral ventricle (*arrow*, [figure 2](#)). Further MRI showed a dilated right middle meningeal artery supplying the larger of these two bifrontal masses (*arrow*, [figure 3](#)). A third intra-axial rim-enhancing left parietal mass (*black arrow*, [figure 1](#)) was also identified.

The two frontal lesions were surgically resected and approximately 1 week later, the left parietal mass was biopsied. Pathological evaluation diagnosed the bifrontal masses as meningiomas and the left parietal mass a glioblastoma multiforme (GBM). Following biopsy diagnosis, she underwent surgical resection and radiation of her GBM.

Meningiomas arise from arachnoid meningotheelial cells and are typically benign WHO grade I neoplasms with a metastatic rate of approximately 0.1–0.2%.^{1 2} There has been little research focusing on the genetic basis of meningioma development, with the most significant finding of the neurofibromatosis-2 gene mutation on chromosome 22q12 being linked to approximately half of all

Figure 2 Axial T2-weighted MRI showing transependymal flow of cerebrospinal fluid from the atrium of the right lateral ventricle (arrow).

meningiomas.² They are slow-growing lesions, more common in women, and have an approximate 1% prevalence in autopsy series.¹

GBMs are the most common primary brain tumours and are highly malignant WHO grade IV neoplasms of astrocytic origin with a poor prognosis.² They may be primary, arise de novo or may

Figure 1 Axial contrast-enhanced T1-weighted MRI showing the two bifrontal extra-axial enhancing lesions (white arrows) that are causing midline shift to the left and mild hydrocephalus. A third rim-enhancing intra-axial left parietal lesion (black arrow) is also identified.

Figure 3 Overlay of a three-dimensional maximum intensity projection MR angiography and axial postcontrast T1-weighted MRI showing a dilated right middle meningeal artery (arrow) supplying the larger of the two bifrontal lesions.

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arise secondary to degeneration by a lower grade astrocytoma. Genetic mutations are most commonly identified in three major cellular pathways in GBMs: the receptor tyrosine kinase/phosphatase and tensin homologue/phosphatidylinositol 3-kinase cell

Learning points

- ▶ Meningiomas are typically benign, WHO grade I neoplasms of arachnoid epithelial origin that are often discovered incidentally and may be intracranial or intraspinal.
- ▶ Glioblastoma multiforme (GBM) is a highly malignant, WHO grade IV neoplasm of astrocytic origin with a 5-year survival of <5%.
- ▶ Various tumour suppressor and cell proliferation gene mutations have been associated with meningiomas and GBMs, which has been a major focus of management/preventative research.

proliferation pathway; the p53 tumour suppression pathway and the retinoblastoma 1 tumour suppression pathway.³ There is a slight male predominance and death usually occurs between 9 and 12 months.²

A literature search found six published reports of synchronous intracranial meningiomas and GBMs.

This patient died of her GBM within 2 years of tumour resection.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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